Food Industry Technical Professional Integrated Degree Apprenticeship Standard, Level 6:

End-point Assessment Plan

June 2017

Introduction & Overview

This document sets out the requirements for end-point assessment (EPA) for the Food Industry Technical Professional integrated degree apprenticeship standard. It will be of interest to employers, apprentices and universities.

This is an integrated degree apprenticeship. It incorporates on-programme academic and workplace learning and assessment with an independent end-point assessment to test the knowledge, skills and behaviours of the standard. It will typically take 4 years to complete, with the EPA taken in the last 6 months.

Awarding Universities will be responsible for the on-programme and EPA requirements. They must be on the Education & Skills Funding Agency (ESFA) Register of Apprenticeship Training Providers. In addition, they must be approved to offer the EPA for this standard and be on the ESFA Register of Apprentice Assessment Organisations.

The integrated degree apprenticeship is worth 360 credits. Apprentices must successfully pass 320 on-programme credits prior to taking the EPA, which is worth 40 credits. Apprentices without English and mathematics at level 2 on entry, must achieve level 2 prior to taking their EPA. The EPA should only start once the employer is confident that the apprentice has developed all the knowledge, skills and behaviours defined in the apprenticeship standard and they hold a portfolio to evidence this.

The EPA consists of two distinct methods:

- Workplace Project
- Technical Interview, underpinned by a portfolio of evidence

Performance in the EPA will count towards the overall degree classification. Apprentices cannot successfully complete the degree and therefore the apprenticeship without successfully passing the EPA. Performance in the EPA will be separately graded and determine the apprenticeship grade of pass, merit, distinction or fail.

End-point Assessment Gateway

The EPA should only commence once the employer is confident that the apprentice has developed all the knowledge, skills and behaviours defined in the apprenticeship standard and they hold a portfolio to evidence this. Employers may wish to take advice from the apprentice's university.

The portfolio will be used to underpin the EPA technical interview. It may also be used to support the evidence requirements for professional recognition, should the apprentice wish to apply. It must be presented in line with the relevant profession body's guidance and document the experience gained from work and study against the standard. It will typically refer to performance review documentation, training records/certificates and work products such as processes and procedures, risk assessments, reports, meeting records, statistical trend analysis, plans and costings.

Apprentices must complete 320 on-programme credits and pass all on-programme modules prior to taking their EPA.

Apprentices without English and mathematics at level 2 on entry, must achieve level 2 prior to taking their EPA.

An apprentice must have a project outline agreed with their academic supervisor and workplace representative The outline must detail the project title, scope, key activities/milestones and expected outputs/measures of success.

End-point Assessment Independent Assessor(s)

Universities in their role of Independent Assessment Organisation (IAO) must appoint:

- An independent assessor to assess the Workplace Project
- An independent panel (IP) to conduct the Technical Interview

Independent assessors must meet the following requirements:

- Be independent of the on-programme delivery, the apprentice and their employer
- Hold a degree in a related area such as Food Science, Food Technology, Chemistry, Microbiology or Nutrition
- Have a minimum of 5 year's food and drink industry experience
- Complete a minimum of 5-days food and drink related continuing professional development per year
- Be a professional member of a relevant professional body
- Attend a minimum of one assessor standardisation meeting per year

Independent assessors should be sourced from another university, industry or a professional body; or if none of the above options are available another department within the same university.

The Independent Panel for the Technical Interview will comprise of:

- An independent assessor, as defined above
- An on-programme tutor. Their role is to provide specialist technical input relevant to the apprentice's project; this will normally be the apprentice's project supervisor
- A representative from the apprentice's employer, typically their line manager. Their role is to provide technical input in relation to the apprentice's workplace policy and procedures and confirm authenticity of their apprentice's work

The independent assessor will solely determine the grade.

End-point Assessment Methods & Timescales

The end-point assessment consists of two distinct assessment methods:

- Work-based Project
- Technical Interview, underpinned by a portfolio

The end-point assessment must be completed over a maximum period of 6 months. The 6-month period will start post gateway, which includes the apprentice agreeing the subject and focus of the work-based project with their academic supervisor and workplace representative Universities must hold a bank of acceptable projects; however, apprentices must not be limited to these.

Assessment method one – Work-based Project (WP)

The apprentice will be required to produce a report of 12,000 words (+/- 10% plus references, appendices and abstract) based on a work-based project which enables the individual to meet the standard criteria outlined below:

Knowledge:

- A comprehensive understanding of legislation and regulation in the food and drink industry

Skills:

- Establish process parameters and control requirements; measure the impact of process on product, set limits and take action to deal with process and product non-conformance
- Use project management tools to deliver projects to time, cost, specification and quality
- Develop and demonstrate critical evaluation/analysis of complex information and data

Behaviours:

- Problem solving: works to identify and ensure root causes of problems are resolved, demonstrating a tenacious approach
- Company/industry perspective: knowledge of company and food industry, acts as an ambassador both internally and externally

- Innovation: Demonstrates curiosity to foster new ways of thinking and working; seeks out opportunities to drive forward change and improvements for the business

All work relating to the project and report write-up, must be completed during the EPA period; excluding preliminary research to inform the project outline.

Example project titles include:

- Introduction of a new product line into the factory
- Establishment of an environmental management system for a site
- Implementation of lean manufacturing techniques
- Creation and implementation of an internal audit process
- The management of hygienic operations and the effective control and use of cleaning chemicals
- Introduction of processes and control measures for allergens within a factory proposal inclusive of costs

The project must be submitted by the end of month 5 of the 6-month end-point assessment period, at the latest, to allow for marking ahead of the technical interview.

The work-based project will be marked by an independent assessor who will determine the grade for this component.

This component of the end-point assessment will count towards 70% of the apprenticeship grade.

Assessment method two – Technical Interview (TI)

The work-based project must be successfully passed before the Technical Interview.

The Technical Interview will test the candidate's competence as a food industry technical professional by eliciting information on their knowledge, skills and behaviours. This will be underpinned by a portfolio of evidence that the apprentice has developed during the on-programme period.

It will be assessed against the standard statements detailed below:

Knowledge:

- Supply chain management practices and systems to assure the safety, quality and legality of all raw materials, ingredients, goods and services in the work setting. Food safety management systems, specifications, traceability systems, recent scientific developments and techniques to substantiate fraudulent and malicious activity
- New Product Design: specification, scaling-up and technical feasibility and cost analysis

Skills:

- Coordinate non-conformance and participate in incident management teams; implement incident management procedure
- Lead and develop a small technical team on site

Behaviours:

- Influence and persuades key stakeholders effectively: drive effective relationships
- Responsiveness to change: flexibility to changing working environment and demands

The interview will be conducted by the Independent Panel; the independent assessor will solely determine the grade.

The Technical Interview must take place in a controlled environment; typically, at the apprentice's University or the apprentice's employer's premises. It will be between 45 minutes and a maximum of an hour's duration. Questions will be drawn from a standard bank of questions developed by the apprentice's University. These questions will be formulated so as to address the KSB (as identified above and summarised in Annex A). The panel will ask 6 standardised questions covering the themes of:

- Leadership in the food and drink environment
- Working with others
- The design and introduction of a new food product
- Assessing the technical feasibility of a new food product
- Undertaking cost analysis
- Change management in a food and drink environment

Questions must be open, holistic and competency based in design. The independent assessor/panel may ask open follow up questions to probe further or seek clarification. Questions and responses must be recorded by the independent assessor. Example questions include:

- Please provide an example of when you have led a technical team on site and explain your approach to leading that team. How do you think that your leadership impacted on the performance of the team?
- What are the key stages that are involved in the design and introduction of a new food product?
- How would you assess the technical feasibility of producing a new product?
- How would you undertake the cost analysis of a new product?
- Tell me about an occasion when you have had to change the way you or your company works to deliver effective change

The IP will be provided with a copy of the apprentice's portfolio at least 7 days prior to the Technical Interview. The apprentice will be allowed to bring a copy of the portfolio to the Interview and draw on its contents when answering questions from the IP.

This component of the end-point assessment will count towards 30% of the apprenticeship grade.

Apprenticeship Grading

The grading criteria for each EPA method is detailed in Annex B.

The final decision on whether the apprentice has passed the end-point assessment lies with independent assessors who will grade the apprenticeship in accordance with this plan.

In order gain a pass or higher in the EPA, apprentices must achieve a minimum of a Pass in both the Workplace Project and the Technical Interview.

The grades for both components will be combined, according to their weighting, to determine the overall grade of pass, merit or distinction.

The grading boundaries are as follows:

- Fail: below 40%
- Pass: 40 - 59%
- Merit: 60 – 69%
- Distinction: 70% +

Achievement at 40% will demonstrate that the apprentice has met all of the requirements of the standard. An Apprentice who achieves a merit or distinction will be demonstrating performance above the requirements of the standard.

Re-sits/re-takes

Apprentices will be offered the opportunity to take a re-sit/retake in line with University academic regulations. Both the apprentice's University and their employer have to agree that a re-sit/re-take is an appropriate course of action. A re-sit does not require further learning/training, whereas a re-take does. Where an apprentice needs to re-sit/re-take the work-based project component the entire EPA must be re-taken in full in a new 6-month period. If the Technical interview requires a re-sit/re-take, but the work-based project has been successfully achieved, this should be accommodated within the original six month EPA period. Re-sits/re-takes are not offered to apprentices wishing to move from pass to merit or distinction. Apprentices should have a supportive action plan to prepare for the re-sit/re-take.

Apprentices who take a re-sit/re-take will only be able to achieve a pass in their overall grade, unless there are exceptional circumstances which are beyond the control of the apprentice as determined by their university.

University/Independent Assessment Organisations Internal Quality Assurance

Internal quality assurance refers to the requirements that Universities as IAOs must have in place to ensure consistent (reliable) and accurate (valid) assessment decisions.

IAOs for this standard must undertake the following:

- appoint independent assessors and panel members that meet the requirements as detailed in this plan – see above
- produce assessment tools and supporting materials for the EPA that follow best assessment practice
- provide training for independent assessors in terms of good assessment practice, operating the assessment tools and grading
- have quality assurance systems and procedures that support fair, reliable and consistent assessment across the organisation and over time
- operate regular standardisation events that enable assessors to attend a minimum of one event per year
- operate moderation of assessment activity and decisions, through examination of documentation and observation of activity, with a minimum of 5% percent of each independent assessors' assessments moderated
- have an external examiner in line with University requirements

External Quality Assurance

We are exploring whether QAA can undertake external quality assurance for this standard, arrangements will be confirmed by the end of 2017.

Professional Body Recognition

This apprenticeship is designed to prepare successful apprentices to meet the requirements for registered scientist or to be on the register of food safety professionals. The portfolio of evidence developed during the on programme should be put together in a way which supports the professional recognition process, negating the need for individuals to complete a separate process. It is recommended that universities work with the appropriate professional body to seek guidance on the criteria to be covered by the portfolio.

Implementation

Affordability: It is anticipated that the EPA will not represent more than 20% of the apprenticeship funding band.

Volumes: It is anticipated that there will be 150 starts per year on this apprenticeship.

Universities will need to develop degree programmes that meet the requirements of this plan, including EPA tools, processes and procedures. It is anticipated that some Universities will offer this standard from September 2017.

Annex A: Summary of Knowledge, Skills and Behaviours to be assessed by each assessment method (see annex C for Higher Order statement mapping)

Assessment method	Key
Technical Interview	TI
Work-based Project	WP

Knowledge statement	Assessment method
1. A comprehensive understanding of legislation and regulation in the food and drink industry	WP & TI
2. Supply chain management practices and systems to assure the safety, quality and legality of all raw materials, ingredients, goods and services in the work setting. Food safety management systems, specifications, traceability systems, recent scientific developments and techniques to substantiate fraudulent and malicious activity	TI
3. New Product Design: specification, scaling-up and technical feasibility and cost analysis	TI

Skills statements	Assessment method
1. Establish process parameters and control requirements; measure the impact of process on product, set limits and take action to deal with process and product non-conformance	WP
2. Use project management tools to deliver projects to time, cost, specification and quality	WP
3. Coordinate incident investigation and participate in incident management teams; implement incident management procedure	TI
4. Lead and develop a small technical team on site	TI
5. Develop and demonstrate critical evaluation/analysis of complex information and data	WP

Behaviour statements	Assessment method
1. Influence and persuades key stakeholders effectively: drive effective relationships	TI
2. Problem solving: works to identify and ensure root causes of problems are resolved, demonstrating a tenacious approach	WP
3. Responsiveness to change: flexibility to changing working environment and demands	TI
4. Company/industry perspective: knowledge of company and food industry, acts as an ambassador both internally and externally	WP & TI
5. Innovation: Demonstrates curiosity to foster new ways of	WP

thinking and working; seeks out opportunities to drive forward change and improvements for the business	

The statements listed above are higher order statements, they encapsulate all of the KSB statements within the standard.

Annex B Grading Criteria

Grading Criteria - Workplace Project

Knowledge/Skill/Behaviour	Pass *Low/Mid/High*	Merit *Low/Mid/High*	Distinction *Low/Mid/High/Exceptional*
K1	Understanding of food legislation and regulations within own organisation in the food and drink industry	Understanding of food legislation and regulation across a range of sectors in the food industry. Demonstrates knowledge of the systems that seek to ensure regulatory compliance	An excellent depth and breadth of understanding of food legislation and regulation demonstrating knowledge of the systems that seek to ensure regulatory compliance and the implications of non-compliance
S1	Establishes process parameters and control requirements; impact of process on product; set limits and take action to deal with process and product non-conformance	Reviews and evaluates process parameters and control requirements in order to optimise production and avoid non-conformance.	Demonstrates an ability to recognise opportunities for future improvements and to provide a rationale for their implementation.
S2	Project management tools applied to deliver projects to time, cost, specification and quality	Select and apply appropriate methods from a range of project management tools.	Optimises project deliverables through a process of review and evaluation.
S5	Demonstrates critical evaluation/analysis of complex information and data	Demonstrates a high level of critical evaluation/analysis of complex information and data	Demonstrates an excellent level of critical evaluation/analysis and synthesis of complex information and data
B2	Root cause of problems are resolved, demonstrating a tenacious approach	Identifies root cause of problems, determines, implements and manages appropriate solutions	Adopts a proactive approach to risk management developed from root cause analysis and proposes recommendations to reduce or mitigate against risks.
B5	Knowledge of company and food industry, acts as an	Demonstrates awareness of the influence of stakeholders on the company and the food	Engages with corporate strategy and works to promote the company's aims and

	ambassador both internally and externally	industry	objectives.
B7	Demonstrates curiosity to foster new ways of thinking and working for change and improvements to the business	Demonstrates curiosity to foster new ways of thinking and working and identifies and proposes opportunities for change and improvements to the business	Demonstrates curiosity to foster new ways of thinking and working and identifies and proposes opportunities for change and improvements to the business providing a full justification and rationale for modification

Grading Criteria – Technical Interview

Knowledge/Skill/Behaviour	**Pass** *Low/Medium/High*	**Merit** *Low/Medium/High*	**Distinction** *Low/Medium/High/Distinction*
K2	**a)** Understanding of supply chain management systems and the potential risks associated with their operation **b)** Understanding of food safety management, specifications and systems and how they apply to the food industry **c)** Understanding of recent scientific developments and techniques to substantiate fraudulent and malicious activity	a) Establish high level of understanding of supply chain management systems and the potential risks associated with their operation b) Demonstrates very good understanding of food safety management, specifications and systems and how they apply to different sectors of the food industry c) Interprets a high level of understanding of recent scientific developments and techniques to substantiate fraudulent and malicious activity	**a)** Critically appraises a range of supply chain management systems and provide justification for the selection of the appropriate system **b)** Evaluates the key elements of food safety management systems **c)** Critically evaluates a range of scientific developments and techniques to substantiate fraudulent and malicious activity

K3	New product design: understanding specifications, scaling-up and technical feasibility and cost analysis	Demonstrates a comprehensive understanding of the various disciplines that are applied to the phases of New Product Design	Analyses the factors that determine the success of New Product design and evaluates the strategies involved in the development of a new product line.
S3	Participate in the process of non-conformance investigation and describes the effectiveness of incident management procedures	Appraises the process of non-conformance investigation and evaluates the effectiveness of incident management procedures	Adopts a proactive approach to addressing non-conformance and proposes recommendations to avoid further non-conformances and/or to improve the process of investigation and incident management
S4	Involved in the development of a technical team on site	Takes a lead in the development of a technical team on site	Evaluates team performance, recognising individual skills and contributions and identifying skills gaps.
B1	Influence and persuade key stakeholders effectively; drive effective relationships	Developing relationships with the aim of realising potential benefits for the company	Provides evidence of positive outcomes from the development of stakeholder relationships.
B3	Responsiveness to changes within the working environment	Willingness and flexible to implement changes within the working environment	Recognises and proactive to the need for and suggests changes to respond to new workplace demands
B4	Knowledge of company and acts as an ambassador internally	Demonstrates awareness of the influence of stakeholders on the company and the food industry	Engages with corporate strategy and works to promote the company's aims and objectives.

Grading Scheme

In order to pass the workplace project, apprentices must achieve a pass as a minimum in every knowledge, skill and behaviour statement being assessed by that assessment method.

In order to pass the technical interview, apprentices must achieve a pass as a minimum in every knowledge, skill and behaviour statement being assessed by that assessment method.

In order gain a pass or higher in the EPA, apprentices must achieve a minimum of a pass in both the workplace project and the technical interview.

Calculating the Final Grade:

Each knowledge, skill and behaviour statement being assessed by an assessment method will be graded pass (low/medium/high), merit (low/medium/high) or distinction (low/medium/high/distinction). The criteria builds on each other, that is apprentices achieving a merit will have demonstrated the pass criteria and those achieving a distinction will have demonstrated the pass and merit criteria.

To determine the final grade for each assessment method the grade achieved for each knowledge/skill/behaviour is converted to the numerical equivalent set out in the table below. The total is divided by the number of knowledge, skills and behaviours being assessed to give an average. Each assessment method grade is then allocated using the mark ranges: Pass: 40 - 59%; Merit: 60 – 69%; Distinction: 70% +

Numerical Equivalent Table

Grade	Knowledge/Skill/Behaviour Grade	Numerical Equivalent
Distinction	Exceptional Distinction	96
	High Distinction	89
	Mid Distinction	81
	Low Distinction	74
Merit	High Merit	68
	Mid Merit	65
	Low Merit	62
Pass	High Pass	57
	Mid Pass	50
	Low Pass	43

The overall EPA grade is determined by combining the two assessment method grades, using the numerical equivalent system set out above but applying a weighting of 70 (Workplace Project)/30 (Technical Interview).

Annex C Standard for Food Industry Technical Professional Integrated Degree Apprenticeship

Knowledge. Skills and behaviour mapping

Higher order knowledge:

1. Food allergy and intolerance management, including labelling requirements and management systems for control of allergens in manufacturing
2. Supply chain management practices and systems to assure the safety, quality and legality of all raw materials, ingredients, goods and services in the work setting. Food safety management systems, specifications, traceability systems, recent scientific developments and techniques to substantiate fraudulent or malicious activity
3. New Product design: specification, scaling-up and technical feasibility and cost analysis

Higher order skills:

1. Establish process parameters and control requirements; measure the impact of process on product, set limits and take action to deal with process and product non-conformance
2. Use project management tools to deliver projects to time, cost, specification and quality
3. Coordinate investigations into and responses to non-conformances and participate in incident management teams; implement incident management procedure
4. Develop and demonstrate critical evaluation/analysis of complex information and data
5. Lead and develop a small technical team on site

Higher order behaviours:

1. Influence and persuades key stakeholders effectively: drive effective relationships
2. Problem solving: works to identify and ensure root causes of problems are resolved, demonstrating a tenacious approach
3. Responsiveness to change: flexibility to changing working environment and demands
4. Company/industry perspective: knowledge of company and food industry, acts as an ambassador both internally and externally
5. Innovation: Demonstrates curiosity to foster new ways of thinking and working; seeks out opportunities to drive forward change and improvements for the business

Lower order knowledge assessed as part of the higher order statements:

The microbiology and microbial ecology in a range of foods	K2/S1/S2
Food legislation & regulation as appropriate to own organisational context	K1/S1/S2
Microbiological and chemical testing procedures relevant to food safety and quality, including sampling and interpretation of results	S1/K1/S2
Principles of commonly used laboratory chemical and physical test methods: analysis of fat, moisture, carbohydrate, protein, energy, density and melting point	S1/K1/S2
Scientific principles underpinning food chemistry and physics: composition of food and its nutritional value and trends; including rheology, fluid dynamics, thermodynamics	S5/S2
Enhancing nutritional impact of food components - macro- and micro-nutrients; preserving and enhancing nutritional values in processing, distribution and sale; delivering nutritious products meeting dietary requirements, habits and consumer trends	S5/S2/S2/K1
Technical knowledge of physical attributes and chemical constituents of commonly used ingredients: sugar, flour, fat, starch, yeast, milk, meat, fruit, vegetables and additives	K1/S1/S5?S2
Underlying principles of various common food processes: mixing and blending, batch and continuous cooking/baking, aseptic processing, canning, pasteurisation, retorting and UHT, enrobing, cooling and freezing	K2/K3/S1/S2
Physical hazards and their control in foods	S1/K1
How to plan, manage and review operational processes, monitor costs and Key Performance Indicators	S2/B4/B2/S1
How to collect, interpret and analyse technical data, use mathematical techniques and present technical information; how to carry out statistical process control studies, and how to interpret the data to improve the process	S1
How to appropriately select laboratory test methods and interpret results	S1/S3/K2
Characteristics of packaging systems to control food safety hazards and quality, including understanding of ultra-heat treatment/aseptic/Cook-Chill/modified atmosphere systems and managing product flow to assure shelf life compliance at all stages	K1/K2
Factors governing food safety, integrity and sustainability within the global supply chain	K1/K2

Problem solving techniques, including root cause analysis and investigation methods	B2
Ethical issues in the food industry, including the environment	B4/K1/B3/B5/S1
Hygienic design of factories/equipment and procedures, including Cleaning In Place	K1/S1/B4
How to lead, develop and manage resources, people and budgets	S4/S2
How to develop, implement and review Continuous Improvement Plans	S4/K2/B5

Lower order skill is assessed

Lead, develop and implement the Hazard Analysis and Critical Control Point system and team on site	**S4/K2/K1**
Interpret microbiological results; spot and analyse trends to diagnose or anticipate issues; define and implement action plans	**K2/S3**
Develop product specifications taking into account the key risk factors in product design; ensure customer pre-requisites are implemented and followed	**K2/K3**
Manage, develop and implement internal audit schedule to ensure compliance with legal, industry and customer standards; keep abreast of new standards; credibly host third party audits	**K2/S1/S3/B4**
Select the most appropriate tools and methodology to demonstrate compliance, food safety culture and delivery of consistent quality of products	**K2/S5/K1/S2/B2**
Establish cleaning and hygiene programmes and audit methodology; set up monitoring programmes; interpret data; identify different risk zoning in an operational area and the different hygiene requirements; manage internal and external cleaning contractors	**B3/B2/B5/K2/S1/S4/S5**
Manage complaint performance through the identification of trends and the design of corrective action programmes to improve credibility with customer	**B1/B5/S3/S1**
Design and implement site procedures to ensure legal compliance with current food law; lead any investigation into legal contravention with the relevant enforcement authorities	**K1/K2/S4/S3**
Optimise and control parameters that influence common industry processes: washing, mixing, heating, cooking, cooling/chilling, freezing, drying, freeze drying	**S1/K2**

Be able to liaise and co-ordinate with other functions to deliver New Product Development projects. When appropriate take the lead and drive the project	**S3/S4/B5**
Review and select relevant scientific techniques taking into account cost and practicalities; experiment, collect and analyse data and formulate solutions	**K2/B5/B2**
Manage supplier intake controls; carry out supplier audit & performance reviews and risk assessment; maintain approved supplier, contractor and vendor performance process	**B1/S1/K2**
Design and implement traceability system fully compliant with customer and legal requirements; monitor to verify validity of process	**K1/K2**

Lower order behaviours:

Ownership of work: accepts responsibility, is proactive, plans work, demonstrates integrity, aims for excellence	S1/B2/B1/B5
People development: proposes objectives to support the business, seeks learning, drives the development of self and others	B5/S4
Inspire others through leading by example	B1/S3/B4
Integrity & respect: respect for colleagues, effective communication at all levels, adapts style	B3/B4/B1
Working in a team: builds good relationships with others, works collaboratively, contributes ideas and challenges appropriately	S3/B4